815 combination / subcombination

02 14887

(B) in another combination

CLAIMS

Subcombination or

821.01 8.23.02 8.23.02

1.5 MPA = 217.5 psi

1. Coated optical fiber comprising a glass optical fiber, a primary coating applied thereon, a secondary coating and optionally an ink composition subsequently applied thereon, wherein the primary coating has a storage modulus at 23°C ~~(E'$_{23}$), has~~ an equilibrium modulus of about 1.5 MPa or less, and a ~~cavitation strength~~ at which a tenth cavitation appears (σ^{10}_{cav}) of at least ~~about~~ 1.0 MPa as measured at a deformation rate of 0.20% min^{-1} storage, said cavitation strength being at least about 1.4 times said storage modulus at 23°C.
2. Primary coating composition when cured having an equilibrium modulus of about 1.5 MPa or less, a storage modulus at 23°C (E'$_{23}$) and a cavitation strength at which a tenth cavitation appears (σ^{10}_{cav}) of at least about 1.0 MPa as measured at a deformation rate of 0.20% min^{-1} storage, said cavitation strength being at least about 1.4 times said storage modulus at 23°C.
3. Primary coating composition according to claim 2, wherein the cavitation strength σ^{10}_{cav} is at least about 1.5 times the storage modulus at 23°C.
4. Primary coating composition according to any one of claims 2-3 wherein the cavitation strength σ^{10}_{cav} is at least about 1.1 MPa.
5. Primary coating composition according to anyone of claims 2-4, wherein the composition comprises at least one cross-linking component introducing bimodal distribution into the composition.
6. ✓ Primary coating composition according to claim 5, wherein said cross-linking component ~~is an alkoxylated diol dia~~crylate.

w/o traverse

7. Method for curing a primary coating composition comprising the steps of (i) preparing said primary coating composition, which when cured without preflash is having an equilibrium modulus of about 1.5 MPa or less and a cavitation strength at which a tenth cavitation appears (σ^{10}_{cav}) of at least about 0.9 MPa as measured at a deformation rate of 0.20% min^{-1}, said cavitation strength being about 1.0 times or less of its storage modulus at 23°C (E'$_{23}$), and

(ii) curing said composition with a first dose comprising at least one flash f UV-light of a total energy between about 5 and 50 mJ/cm^2, and

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(iii) subsequently curing the pre-cured coating with such a second UV-dose that the pre-cured coating attains at least 85% of its maximum attainable equilibrium modulus.

8. Method according to claim 7, wherein said first dose comprises at least one flash of UV-light having a cut-off of the wavelengths below 260 nm.

9. Primary coating having an equilibrium modulus of about 1.5 MPa or less, wherein said coating, when measured in an uniaxial tensile test and represented in a relative Mooney plot, shows a curve which increases on increasing the strain λ (or lowering 1/λ) and of which at least one part has a value higher than the value calculated by using the function f(λ) equal to

$$f(\lambda)=a\frac{L^{-1}\left(\frac{\lambda}{\sqrt{b}}\right)-\lambda^{-\frac{3}{2}}L^{-1}\left(\frac{1}{\sqrt{\lambda}\sqrt{b}}\right)}{\lambda-\frac{1}{\lambda^{2}}} \qquad (6)$$

for 1/λ of about 0.60 or less wherein a = 0.94 and b = 11.20.

10. Primary coating according to claim 9, wherein a = 0.86 and b = 9.85.

11. Primary coating having an equilibrium modulus of about 1.5 MPa or less, wherein said coating, when measured in an uniaxial tensile test and represented in a relative Mooney plot, shows a curve which increases on lowering 1/λ and of which at least one part has a value higher than the value calculated by using the function f(λ) equal to

$$f(\lambda)=a\frac{L^{-1}\left(\frac{\lambda}{\sqrt{b}}\right)-\lambda^{-\frac{3}{2}}L^{-1}\left(\frac{1}{\sqrt{\lambda}\sqrt{b}}\right)}{\lambda-\frac{1}{\lambda^{2}}} \qquad (6)$$

for 1/λ of about 0.60 or less wherein a = 1.17 and b = 15.0 and wherein said coating has a strain energy release rate Go, as measured at a rate of about 1.10^{-5} s^{-1} or less, of higher than 55.0 – 24.0 x $E_{equilibrium}$.

12. Primary coating having an equilibrium modulus of about 1.5 MPa or less according to anyone of claims 2-6 and claims 9-11, wherein said coating is having a strain nergy release rate Go of at least about 20 J/m^2 as

measured at a rate of about 1.10^{-5} s^{-1} or less.

13. Primary coating composition according to anyone of claims 9-12, wherein the composition comprises at least one cross-linking component introducing bimodal distribution into the composition.

14. Primary coating composition according to claim 13, wherein said cross-linking component is an alkoxylated diol diacrylate.

15. Primary coating having an equilibrium modulus of about 1.5 MPa or less and a calculated volumetric thermal expansion coefficient α_{23} of about 6.85×10^{-4} K^{-1} or less.

Sub B3

16. Primary coating according to any one of claims 2-6 and 9-15, wherein the equilibrium modulus is about 0.9 MPa or less.

17. Coating system for an optical glass fiber comprising a primary coating according to any one of claims 2-6 and claims 9-16 and a secondary coating having a volumetric thermal expansion coefficient α_{23} of at least about 3.15×10^{-4} K^{-1}.

18. Coating system according to claim 17, wherein the secondary coating has a calculated volumetric thermal expansion coefficient α_{23} of about 6.85×10^{-4} K^{-1} or less.

Sub B4

19. Coated optical fiber comprising a glass optical fiber, a primary coating according to claims 2-6 or claims 9-16 applied thereon, a secondary coating applied on the primary coating and optionally an ink composition applied on the secondary coating.

20. Coated optical fiber according to claim 19, wherein the secondary coating is a coating as defined in claims 17-18.

21. Optical fiber ribbon comprising a plurality of coated, and optionally colored optical fibers arranged in a plane and embedded in a matrix composition, wherein the coated optical fiber is a fiber according to any one of ~~claims~~ 19-20.

22. An assembly for measuring the cavitation strength of a coating comprising:

in 3 installed to measure of the mechanical properties

a first member having a first surface;

a second member having a second surface opposing said first surface;

at least one of said first member and said second member being transparent to ultraviolet light; said first surface being mov abl in a

direction normal towards said second surface; said first surface defining with said second surface a cavity for receiving a sample; and

a sub-assembly in contact with said first member or said second member; said sub-assembly comprising at least one element capable of adjusting the position of said first surface or said second surface in such a manner that said first surface or said second surface is perpendicular to the direction of said normal movement.

23. An assembly according to claim 22, wherein both said first surface and said second surface are perpendicular to the direction of said normal movement.

pull out force

24. A tensile testing apparatus comprising the assembly according ~~to any~~ one of claims 22-23.

mechanical properties

25. Method for measuring the cavitation strength of a radiation cured coating comprising the steps of:

making a sample by treating two plates by applying a liquid coating in between the two plates in a thickness of between 10 and 300 μm and over a certain area and by curing said coating with a UV-dose, the treatment of the two plates being such that the adhesion between the plates and the cured coating is sufficient to obtain cavitation before debonding sets in,

placing the sample in a tensile testing apparatus, which is provided with a microscope, in such a way that a substantially parallel alignment and an acceptable compliance of the total tensile testing apparatus is obtained,

running a deformation test on said sample while measuring the force at which a defined number of cavities starts to be visible through the microscope at a certain magnification, and

calculating the stress by dividing said force by the area of the coating applied and reporting said stress in relation to said cavities.

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13. (Amended) Primary coating composition according to claim 9, wherein the composition comprises at least one cross-linking component introducing bimodal distribution into the composition.

B3

16. (Amended) Primary coating according to claim 2, wherein the equilibrium modulus is about 0.9 MPa or less.

17. (Amended) Coating system for an optical glass fiber comprising a primary coating according to claim 2 and a secondary coating having a volumetric thermal expansion coefficient α_{23} of at least about 3.15×10^{-4} K^{-1}.

B4

19. (Amended) Coated optical fiber comprising a glass optical fiber, a primary coating according to claim 2 applied thereon, a secondary coating applied on the primary coating and optionally an ink composition applied on the secondary coating.

20. (Amended) Coated optical fiber according to claim 19, wherein said secondary coating has a volumetric thermal expansion coefficient α_{23} of at least about 3.15×10^{-4} K^{-1}.

21. (Amended) Optical fiber ribbon comprising a plurality of coated, and optionally colored optical fibers arranged in a plane and embedded in a matrix composition, wherein the coated optical fiber is a fiber according to claim 19.

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24. (Amended) A tensile testing apparatus comprising the assembly according to claim 22.

REMARKS

Upon entry of this Amendment, 1-25 will be pending, of which claims 1, 2, 7, 9, 11, 15, 22, and 25 are independent. The claims have been amended to eliminate multiple dependencies. No new matter has been introduced.

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5-9, 14, 19,